Worksheet 2 Selection

Task 1

1. Evaluate the following conditions to TRUE or FALSE

Grade1	Grade 2	Condition	True or false?
80	67	(Grade1>=80) AND (Grade2 >=80)	
82	80	(Grade1>=80) OR (Grade2>=80)	
35	50	(Grade1>30) OR (Grade1<50)	
65	-	(Grade1<30) OR (Grade1 >80)	
0	75	NOT(Grade1>50) AND (Grade2>50)	
65	85	NOT(Grade1<80) AND NOT (Grade2<80)	

2. Write a pseudocode algorithm to include a validation Rule: Read a pupil age and output a message “Valid pupil age” if it is at least 10 and less than 19 years old. Otherwise output the message “Invalid input: enter a value from 11 to 18”.

Task 2

3. An online bookstore gives free 2nd class mail delivery (code 2) for any order value greater than or equal to £15.00

   For order values less than £15.00, 2nd class mail delivery costs £3.50.

   For any value of order, a customer may choose to pay £5.00 for guaranteed next day delivery (code 1).

   (a) Write pseudocode for an algorithm which allows the user to enter the total value of their order. They are then asked whether they want to pay for guaranteed next day delivery. Depending on their answer, and the value of the order, the program displays the postage charge and the overall total charge.

   (b) What will be the postage cost in each of the following cases?

   (i) Order value £10.00 Postage code 2:

   (ii) Order value £15.00 Postage code 2:

   (iii) Order value £30.00 Postage code 1:

4. Study the decision table below and develop a solution using pseudocode that meets the rules described in the table and outputs a message describing the action to be taken.

		Rules							
Conditions	Exam >90	Y				Y			
	Exam >80 and <=90		Y				Y		
	Exam >70 and <=80			Y				Y	
	Exam <=70				Y				Y
	Attendance > 90%	Y	Y	Y	Y	N	N	N	N
Actions	Grade = A	X							
	Grade = B		X						
	Grade = C			X					
	Fail				X	X	X	X	X

Task 3

5. A home security system is designed to sound an alarm if a movement sensor on the ground or first floor signals movement when the alarm is triggered. The trigger is set to ON when the family go out and set to OFF via a keypad when they return home. If the alarm is triggered and a movement is detected by one of the movement sensors, the alarm is set to ON which will cause a siren to wail and light to flash. A message is sent via text to the owner's mobile phone indicating an intrusion was detected. You are required to write an algorithm to read the input from the sensors and the alarm trigger switch and produce appropriate output by setting the Alarm to ON and sending and "Intruder alert" message to the phone.

   (a) Write this in pseudocode using a nested IF statement. Use two variables **movementGround** and **movementFirst**. When sending the alert differentiate the message to tell the user if the intrusion is on the ground or first floor. Send two messages if intruders are detected on both floors.

   (b) Write a similar algorithm to the first. Use the same sensor variables but this time use Boolean operators to write the algorithm using a single IF.. THEN.. ELSE statement to test for movement on either floor if the alarm has been triggered. You do not need to differentiate the message, simply output "Intruder alert!" if the trigger is ON and movement is detected.

6. Write a program in pseudocode that displays a menu with three option choices for a car rental firm. The choices are

   1: Economy Car

   2: Saloon Car

   3: Sports Car

   After the user enters a choice, the program will tell them if it was invalid, in which case the program will end.

   If a valid choice is entered, the program will ask them if they wish to proceed or cancel. After they respond, the program will confirm their response and then output the message “Have a nice day.”

7. Write [part of] a pseudocode program that allows the user to input medical symptoms, and gives a diagnosis.

   For example: The program may ask if the patient has a temperature. If they answer Yes, they are asked if their throat is sore. If the throat is sore, then print "You may have a throat infection". If the throat is not sore, ask if they have a cough, and if they answer Yes, then print "You have a chest infection". If neither, they are diagnosed with a fever.

   If they do not have a temperature, you can end the program with a suitable message.